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ETHNOPHARMACOLOGICAL STUDIES OF *Polypodium vulgare* Linn.: A COMPREHENSIVE REVIEW

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ABSTRACT

Polypodium vulgare Linn. commonly called as *Bisfaij* is a medicinal plant which is used in various ailments. It is one of the most archaic and essential plant, belonging to the family Polypodiaceae. It contains organic substances such as resin, tannins, steroids, flavonoids, alkaloids, glycosides, protein, reducing sugar and inorganic substances like calcium, magnesium, potassium, sulphur, iron and chloride. It is used in Unani system of medicine for the treatment of sorethroat, stomach-ache, leprosy, melancholia, spleenomegaly, haemorrhoids, rheumatic swelling of the joints etc. Besides this, it has other pharmacological activities too such as antiepileptic, neuro-psychopharmacological, antipyretic, antibiotic, antiviral etc. This review paper discuses the medicinal values of *Polypodium vulgare* Linn. in Unani medicine as well as its modern pharmacology and gives a new impetus to utilize *Bisfaij* in various disorders.

Keywords: *Bisfaij*, *Polypodium vulgare* Linn, Phytopharmacology, Unani Medicine.

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INTRODUCTION

Unani system of medicine is one of the venerable traditional systems of medicine. The fortitude of the system is in its comprehensive and individualistic accession to health promotion, disease prevention and treatment. *Polypodium vulgare* Linn. (*Bisfaij*), is in consideration of ancient Greeco Arab physicians like Dioscorides, Galen (131-210 A.D), Zakaria Razi (850-925 A.D). In *Zakhirae-e- Kharazmshahi*, Jurjani cited that the rhizome of this plant is a Cardioactive. Avicenna postulated that polypody is a vigorous expeller of black bile from heart and other body organs. *Polypodium vulgare* Linn. is a small, winter green perennial fern attaining a height up to 30cm, extensively dispersed throughout the world. The name is derived from Ancient Greek poly means "many" and podion means "little foot", hence the name polypodium arises from the peculiar shape of its rhizomes branching like a foot. The Persian name derived from Bist (twenty) & Paya (foot), which specify foot like an arthropod which has numerous legs called Arba Arbain Milipede, as the rhizome has multiple of shoots, so due to resemblance it is named as Bistpaya. The Arabic name of bisfaij is Azras-ul-Kalb which means dog's tooth, in delusion to the toothed appearance of the leaves[1,2,3,4]. The traditional use of polypody rhizome has been archived in several books. The polypody rhizome is used for disease of air passages such as cough, cold, adenoids. Tea made from rhizome is used for pleurisy, sorethroat, stomach ache and poultice of root for inflammation[11]. It is also an

important drug for lung and liver diseases. The drug also have ample of pharmacological actions like antiviral, antiepileptic, antipyretic, analgesic, hypotensive, antibiotic and sometimes is used as an insecticide also[6, 22, 23, 24].

Images of *Polypodium vulgare* Linn.

TAXONOMICAL CLASSIFICATION

Kingdom	:	Plantae
Division	:	Pteridophyta
Class	:	Pteridospida
Order	:	Polypodiales
Family	:	Polypodiaceae
Genus	:	*Polypodium*
Species	:	*vulgare*
Botanical name	:	*Polypodium vulgare* Linn.

VERNICULAR NAMES

Arabic: *Azrasul kalb, Saquibal Hajer, Kasirul arjil, Tashmeez, Barzia*. Urdu: *Bisfaij*. English: *Common polypod, Wall fern, Adder's fern*. Hindi: *Bisfaija, Khankali, Kala bichwa*. Persian: *Bispaik*. Latin: *Bazbodia*. Barbary: *Pishnen*. Egyptian: *Ashtiwan*[17,18].

DISTRIBUTION

Polypodium vulgare Linn. is a herbaceous perennial fern found all through the year. It is a native to Europe and also found in eastern Asia, Africa predominantly in northern areas. In India, it has been brought from other countries[25, 27]. It is common in France, ascending up to an altitude of 2000m. Also, quite common in Scandinavia, mostly in southern part of the area, and some species of *Polypodium vulgare* are commencing in America and eastern Asia. It is virtually found in every country of Europe[10].

MORPHOLOGICAL DESCRIPTION OF PLANT IN UNANI (MAHIYAT)

Polypodium vulgare Linn (*Bisfaij*) is a perennial, small fern growing up to a height of about 30cm with an underground stem called rhizome. They are epiphytic ferns, with a creeping, hairy, scaly or irregular rhizome bearing fronds at interval along its length. The rhizome is flattened, yellowish-brown in colour externally and green internally. The drug is characterized by an astringent, sweet and nauseous taste and brittleness in fracture. It has a long, dull green, pinnatifid leaves, present in two rows on the upper side of the stem alternately[34,35].

MORPHOLOGY

Macroscopic: *Polypodium vulgare* Linn. is a winter green fern, growing in large colonies. They are epiphytic or terrestrial ferns. Its rhizome is hairy, creeping and scaly bearing fronds at interval along its length. The stem scales are triangular in shape, irregular in size, red-brown in colour, up to 4 mm long. Leaves are long, dull green, glabrous and pinnastisect to pinnatifid, alternately arranged in two rows on the upper side of the stem. The texture of leaves is somewhat leathery and herbaceous[3]. The crude drug consists of dried rhizomes pieces of varying lengths and to the thickness of a squill. In cross-section, they are flattened to round and yellowish brown to dirty brown externally. The upper surface is attached with tubercles and some portion of the base of fronds still adheres. The under surface is more or less spinous from the remains of broken radicles. The drug has a characteristic ferry odour and a sweet, astringent, nauseous taste, moderately hard and brittle in fracture[36].

Microscopic: The transverse section of the rhizome is slightly oval to round in shape. The whole ground tissue of cortex is of thick-walled arranged parallel to the epidermis. Each vascular bundle is surrounded by a thin-walled barrel shaped, single layered endodermis, followed by a single layer of starch containing cells known as pericycle. The vascular bundles are amphicribal i.e phloem surrounds xylem. The xylem cells are differentiated into proto and metaxylems, both

are lignified and thick-walled. Phloem cells are impregnated with dark cells known as conducting parenchyma. The outer most layer is single layered epidermis surrounded by the whole mass cortex and vascular bundles. A dark brown substance is present in various cells of the cortex which is probably tannins[36].

CHEMICAL COMPOSITION

Polypodium vulgare Linn. contains organic substances such as resins, tannins, steroids, flavonoids, alkaloids, glycosides, protein, reducing sugar and inorganic substances like calcium, magnesium, potassium, sulphur, iron and chloride[25,36]. Polypodin A (ecdysterone), polypodin B (5 β-hydroxy ecdysterone), glucocaffeic and polypodin have been isolated[26]. The saponin osladins, polypodosaponin, have been isolated from the rhizome of polypodium vulgare Linn[22]. Its rhizome also contains a lauric acid, butyric acid, succunic acids, hexoic acid, methyl salicylate, isovaleric and α-methylbutyric esters, fatty oil acting as an energetic purgative[11,19]. A resin containing benzylic alcohol and its esters which is strongly anthelmintic (a glucoside samambain)[6,7,20,21] and saponins cyclolanostanic triterpenes-cyclolaudenol have been isolated from rhizomes.

Temperament (*Mizaj*):

Hot in 2nd degree and dry in 3rd degree[2].

Hot in 2nd degree and dry in 1st degree[1, 25, 36, 37].

Hot in 3rd degree and dry in 2nd degree[18].

Parts Used: Root and Rhizome[36].

Dose (*Miqdar Khurak*): 5-10g [1]

7-14g [18]

3-11g [37]

10-15g [25, 36]

Toxicity or adverse effect (*Muzir asrat*): Harmful for lungs and kidney, also produces nausea[32, 33].

Correctives (*Musleh*): Gul-e-surkh (*Rosa damascena* Mill.) and Halela zard (*Terminalia chebula* Retz) are used as corrective to avoid its toxicity and adverse effects[1].

Substitute (*Badal*): Aftimoon (*Cuscuta reflexa* Linn) and Ayarij fiqra can be used as its substitute[1,18].

Coumpound Formulations (*Murakkab*): Itrifal Aftimoon, Itrifal Kishnizi, Itrifal Ustukhuddus, Majoon Chobchini, Majoon Seer Alvikhan, Majoon Ushba, Majoon Najah, Safoof Chobchini[2, 25, 36].

PHARMACOLOGICAL ACTIONS (UNANI)

Mushil-e-Sauda wa Balgham (Purgative of Black bile and Phlegm) [25, 36]

Mufarreh (Exhilarant) [18]

Muqawwi Qalb (Cardio tonic) [1, 18]

Muhallil (Anti-inflammatory) [18, 37]

Munaffis (Expectorant) [38]

Mudir-e-Baul (Diuretic) [1]

Mulaiyan (Laxative) [1]

Hazim (Digestive) [1]

Mane Sara (Antiepileptic) [1]

Dafe Tashannuj (Antispasmodic) [38]

Dafe Humma (Antipyretic) [38]

Dafe Alam (Analgesic) [1]

THERAPEUTIC USES IN UNANI

Amraz-e-Balghami wa Saudawi (Diseases of Phlegm and black bile) [1,18,38]

Bawaseer (Haemorrhoids) [1,18]

Damaa (Asthma) [37]

Eruptions [1]

Juzam (Leprosy) [1,18,37]

Mafasil ka dard (Joint pain) [37]

Malikhuliya (Melancholia) [1,18,37]

Nafkh-e-shikam (Flatulence) [1, 38]

Qulanj (Colitis) [1,18,25,36]

Rheumatic disorders (*Amraze hudar*) [1,18]

Sara (Epilepsy) [1,37]

Warm-e-Tihal (Spleenomegaly) [37]

PHARMACOLOGICAL STUDIES

Analgesic activity [31]

Antibiotic activity [22]

Antiepileptic activity [31]

Antipyretic activity [31]

Antiviral activity [28]

Insecticidal activity [5]

Hypotensive activity [31]

Neuro-psychopharmacological activity [31]

CONCLUSION

Bisfail is one of the most important medicinal rhizome retrieve from the fern *Polypodium vulgare* Linn. of family Polypodiaceae, which is used by the Physicians of Unani system of medicine, for the treatment of various diseases. The modern investigations also confirmed the antiviral, antipyretic, antiepileptic, analgesic, hypotensive and neuro-psychopharmacological activity of *Polypodium vulgare* L. From the above review it can be concluded that new researches endorse the use of rhizome in so many diseases as mentioned in Unani classical literature.

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